

LOEB (H.W.)

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IN THE TREATMENT OF LARYN-
GEAL TUBERCULOSIS.

BY

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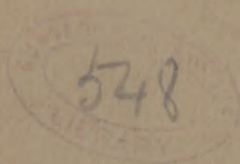
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I HAVE been impelled to use Paquin's antitubercle serum in cases of laryngeal tuberculosis by reason of its positive utility in pulmonary tuberculosis. I have during the past six months seen so many patients with pulmonary tuberculosis improve under the use of this serum that, so far as I am concerned, it deserves to be placed with the antitoxine of Behring and Roux as a great advance in modern scientific therapy.

A considerable number of cases of laryngeal tuberculosis have come under my observation during the past six months, giving a good opportunity to test the value of the serum in this disease. While no conclusive report could under any circumstances be made, so recently supervening upon its use, a more or less detailed account of the clinical experiences with the use of the antitubercle serum may be

of service to my colleagues in laryngology. Every case of laryngeal tuberculosis that has come under my observation from February 28, 1895, until the present time is here noted, in order that the record may be as complete as possible.

CASE I.—J. V., aged thirty years, married, a plasterer by occupation, consulted me first in May, 1894, being referred by Dr. R. G. Taylor, of St. Louis. His previous history was as follows:

After an exposure to cold and dampness in March, 1894, his complaint first manifested itself, beginning with a chill, night sweats, and pains in the chest. He began rapidly to lose flesh and strength, and in two months he lost twenty pounds. He consulted me in May, 1894, with reference to a nasal affection, which was nothing more serious than a chronic inflammation of the nose resulting from a very greatly deflected *sæptum*.

As he was evidently a tubercular subject, in view of his general condition, he was advised to leave this climate; and, acting upon the advice, he left at once for Texas. Some six months afterward I received a letter from him stating that he had not improved, but had become worse, and on February 28, 1895, he again presented himself before me in far worse condition than when he left. A new series of symptoms had appeared: his voice had been hoarse for four months, at first unaccompanied by pain, though he complained of a raw feeling about the throat. A month afterward pain in the throat developed, and this had continually increased since that time. With this increase of pain there had been also an increase of difficulty of deglutition and phonation. His family history was fairly good. His mother died after living fifty years in good health, and his father died at forty years of consumption. No other tuberculosis had existed in his family.

Physical examination showed retraction of right side of the chest, dullness on percussion over right apex, with blowing respiration, cogwheel respiration, mucous click, and bron-

chophony. On the left side there was slight dullness at the apex with prolonged expiration. Examination of the larynx revealed the tissue above the arytenoids and ventricular bands and the aryteno-epiglottic folds considerably infiltrated. There was an ulcer three eighths of an inch long upon the right aryteno-epiglottic fold and a smaller one at the left. Both ulcers were narrow. Both cords were congested, the right being serrated. Many tubercle bacilli were found in his sputum. A very unfavorable prognosis was given, but, inasmuch as he desired to have other opinions upon the subject, he was advised to consult other laryngologists in the city. Dr. Mulhall, after examination, stated that the patient had both throat and lung consumption, that the outlook was serious, with or without the aid of climate; that even with a change of climate the chances of recovery were slight. Dr. Porter stated that the arytenoids were somewhat swollen, the mucous membrane over them being quite red; that the ventricular bands were greatly infiltrated, and on each side were small ulcerations with a characteristic ashy gray color; that the lungs had not progressed so far as is usual in this condition of the throat, but that there was marked dullness at the right apex. Dr. Glasgow stated that he found tubercular infiltration of the upper part of the right lung and also laryngeal phthisis, and advised a dry climate that was not too stimulating, stating that the climate of St. Louis was unfavorable to the arrest of the disease. Dr. Karl von Ruck, Dr. F. L. Sutton, and Dr. G. C. Crandall have at different times examined the patient, and agreed in the diagnosis. The patient was then informed that the Paquin anti-tubercle serum offered a slender chance if nothing more. He was told that no case of laryngeal tuberculosis had as yet been treated by the remedy, but that considerable good had been accomplished during the previous four months in the treatment of pulmonary tuberculosis. He willingly underwent the treatment, which he soon found was both painless and harmless.

He entered the Rebekah Hospital on March 4th, with a temperature of 100° F., and he was at once subjected to a course

of serum treatment, beginning with doses of one cubic centimetre. After a few days the cough, which had been quite harassing, became easier. Some soreness and itching in the axilla and back were experienced, and on account of this the use of the serum was discontinued for a day from time to time, the result of which was the establishment of a tolerance within three or four weeks. The voice soon began to show signs of improvement, becoming quite phonic within six weeks. The pain and dysphagia improved coincidently. Dr. Lemen reported considerable improvement in the condition of the lungs. His weight increased, his appetite improved, and the amelioration of his general condition was very evident. During his stay in the hospital he had occasional relapses, which were readily ascribable to acute or subacute inflammation of the pharynx or larynx, due to some indiscretion. He continued to improve, and on May 6th he left the hospital, having entirely lost the symptoms of pain in the larynx, dysphagia, and night sweats; cough and aphonia greatly bettered. Examination of his larynx showed infiltration greatly reduced, ulcers smaller though quite manifest. The serum was continued, injections of 2·3 to three cubic centimetres being given daily during the following six weeks. He then voluntarily ceased his visits and did not resume treatment for four weeks. When he again presented himself for treatment, it was found that during the interim his cough and aphonia had become worse, and some pain upon swallowing had reappeared. The serum was again used, with results agreeing wholly with his former experience. He accepted a situation and for the first time since the onset of the disease he was able to work. Of late the doses of serum have been increased gradually, until at the present time (September 1st) he takes four cubic centimetres hypodermically every day. The larger doses have produced more rapid improvement and, notwithstanding his work is arduous, he experiences no trouble whatever, barring a huskiness of his voice and a tendency to congestion of the larynx. Dr. Lemen reports that his lungs give no evidence of the presence of abnormal discharge.

Status Præsens.—The entire larynx is of a redder tinge than normal; slight infiltration of arytenoids and aryteno-epiglottic folds and ventricular bands; cords slightly congested; margins of the ventricles thickened; ulcers have entirely disappeared, two small shallow pits, uncovered by deposit, taking their places. For six months I have endeavored to persuade him to permit the use of some application to his larynx, but he has absolutely objected to any laryngeal manipulation, and during the entire course of treatment no local agent has been used on his larynx. Besides the serum no medicinal agent has been administered. During the past five months the temperature has been close to normal, seldom rising to 99°, although previous to the use of the serum the afternoon temperature was always at least 100°. Some tubercle bacilli are still to be found, but they are manifestly diminishing in number. His weight has increased ten pounds since the beginning of the treatment; before he began work his weight was a few pounds greater; he ascribes the reduction to the hot weather and the hard work. His appetite and general condition are better than for years.

CASE II.—Mrs. D., aged thirty-three years, entered the sanitarium on May 5, 1895, giving the following history:

Three years ago she was severely attacked with *grippe*, which was followed by symptoms of pulmonary tuberculosis; these had rapidly become worse, and upon admission her condition appeared altogether hopeless. Emaciation was extreme, dyspnoea was great, night sweats were profuse; anorexia, exceedingly poor assimilation, and diarrhoea united to depress the patient's condition. Some four months previous to her admission she became affected with typical symptoms of laryngeal tuberculosis, pain, dysphagia, odynophonia—all of which had rapidly become worse. The urine was scanty and contained traces of albumin, but no sugar. The temperature varied from 102° or 103° in the evening to 100° in the morning. The lungs showed signs of scattered circumscribed cavities. There was dullness at both apices, with gurgling and cavernous respiration and crackling crepitation in both lungs.

The cavities were well defined by a margin of tubular breathing. The cracked-pot sound could not be elicited.

Upon examination, both arytenoids were found pyriform, the inner margin of the right one being the seat of a typical tubercular ulcer as large as a grain of wheat. Both ventricular bands were infiltrated, but the cords showed no evidence of disease. Tubercle bacilli and many other bacteria were found in large numbers.

Although Dr. Paquin, under whose attention the patient placed herself, stated that the antitubercle serum could do no good in such a hopeless case, the patient and her family insisted on a trial. Accordingly she was placed under treatment at once, with results far better than were expected. Though she died on July 6th, sixty-two days after her admission, improvement in the visible morbid processes and in the objective as well as subjective symptoms lent stronger confidence in the efficiency of the serum than had previously been entertained. As early as two weeks after the beginning of the treatment the pain in the throat and the dysphagia began to diminish, and at the same time the appearance of the larynx became more favorable. In a month the improvement in the throat and pulmonary symptoms was much more marked, and the temperature had decreased two or three degrees. The bowel symptoms began now to be more severe, so that it was found impossible to control the diarrhœa. On June 29th she was seized with fainting, and the temperature descended below normal. Shortly afterward she passed some blood *per rectum*. From this time she rapidly became worse, although seemingly unusually sustained (perhaps by the serum). The local treatment consisted of the use of lactic acid and Chappell's solution; still, I must confess that the laryngeal appearances improved far more than was to be expected from these remedies. In this case the subsidiary infection was extreme and therefore the effect of the serum is all the more remarkable.

CASE III.—Mr. F. R., aged thirty-four years, by occupation a farmer, entered the hospital on May 30, 1895, with the following symptoms: Considerable cough; loss of flesh; great

difficulty of swallowing; huskiness of voice; night sweats; dyspnœa on exertion; pain in the throat; duration of illness, sixteen years. The throat had been affected for three months. The voice had been husky for some time, but he had never been entirely aphonic. The difficulty of swallowing was very considerable, becoming worse as the disease progressed. He had had only a few hæmorrhages. He was very much debilitated, so much so, in fact, that a cure was not to be hoped for. He denied having had syphilis. Both his parents had died under forty: the father was killed, the mother died of consumption at thirty-three.

The physical signs indicated consolidation in both lungs, softening, and a large cavity at the apex of each lung evidenced by the cracked-pot sound, gurgling, and bronchial breathing; there was a smaller cavity on the right side. Examination revealed nothing abnormal in the nasal cavity beyond a mild chronic inflammation. The palate exhibited the customary anæmia. The larynx showed evidence of disease existing for some time. There had evidently been a destruction of the right cartilage of Santorini, and both ventricular bands and aryteno-epiglottic folds were subject to great infiltration. Only the edges of the vocal cords were visible, on account of the excessive infiltration. There was an ulcer upon the apex of each arytenoid, about three sixteenths of an inch in diameter; both were covered with a dirty grayish deposit. The epiglottis was considerably infiltrated, the upper edge being four times as thick as normal. The entire larynx was constantly bathed with a fairly tenacious yellowish deposit. The sputum showed many tubercle bacilli and cocci in large numbers.

The prognosis in this case, as may be supposed, was not very encouraging, in view of the extreme emaciation, the great destruction of the lung, and the mixed infection accompanying. In spite of this, however, he insisted on treatment, which was at once begun. The temperature ranged from 102° in the evening to 99° in the morning, but soon began to diminish, and at the end of ten days the evening temperature rose to 100°. During the following week the temperature did

not rise above 100.4° , and ranged within half a degree of 99° . A week later the temperature was even lower. The larynx exhibited considerable improvement, the epiglottis losing much of its infiltration, and the difficulty of swallowing greatly diminishing. The ulcer over the right arytaenoid showed signs of recovery, healing granulations being quite observable, and the dirty grayish deposit becoming scantier.

The local treatment of the larynx consisted of the use of a two-per-cent. spray of menthol and applications of a fifty-per-cent. solution of lactic acid, with occasional applications of a solution of creosote with Chappell's syringe. The patient left the hospital on June 27th, with an improved condition of his larynx and lungs, but without any marked amelioration of his general condition.

CASE IV.—Mrs. C. K., aged forty-two years, on July 6, 1895, gave the following history: For three months she had suffered from hoarseness, pain in the throat, dysphagia, a sensation of fullness about the throat, dyspnoea on exertion, night sweats, and cough, which had all increased during this time. Both parents were still living, and one brother had died (of lung trouble).

Physical examination showed consolidation at both apices but no cavity.

Bacilli were found in the sputum in fairly large numbers. The nose, pharynx, and palate were fairly normal; both tonsils atrophied; epiglottis normal; both arytaenoids very slightly infiltrated; an ulcer of about the size of a grain of wheat upon the posterior extremity of the right vocal cord. Her general condition was fair, but her weight had been decidedly reduced since the onset of the disease.

The effect of the serum was especially marked upon the ulcer, which has diminished greatly, until at present a rough, pinkish patch marks its former position. Hoarseness, dysphagia, and pain have proportionately disappeared. Her general health has improved and the cough and night sweats have diminished.

CASE V.—Mr. J. O., aged thirty-four years, single, presented himself for treatment, July 12, 1895, with the following

symptoms: Aphonia, dryness of the throat, pain in the larynx, with dysphagia since September. Considerable nasal discharge, but no throat symptoms other than has been stated. The cough is very bad generally during the day; expectoration muco-purulent; great dyspnoea on exertion; no night sweats. He has had several slight hæmorrhages, and has lost thirty-seven pounds since last September. His father died at thirty-six of pneumonia; his mother is still living, aged fifty-four. His general condition is very poor; he looks almost cachectic. His stomach is the source of much trouble—nausea, vomiting, and lack of assimilative power being rather constant symptoms. He had syphilis in 1888. Tubercle bacilli and other bacteria were found in large numbers in his sputum.

Examination of the Chest.—On inspection, depression of the right apex, with dullness as far down as the fourth intercostal space; greater dullness over the left apex. Many râles were to be heard over both lungs.

Examination shows the nasal cavities wide, the pharynx congested, but the palate pale. Both tonsils are atrophied. Some infiltration over arytenoids; left vocal cords considerably infiltrated, especially on the anterior extremity. Right cord covered with a thin deposit of new tissue near its junction with the thyroid.

Upon treatment, the pain and dysphagia rapidly diminished, and after three weeks he suffered no longer from these, but the aphonia was but slightly improved. No very great change was observable in his temperature, which had been quite variable and irregular since his admission. During the first week it reached 103° , and was commonly above 102° in the evening. During the last week in August it reached 102° only once, and the evening temperature was generally nearer 100° . General condition much improved.

CASE VI.—Mrs. A. G., aged forty years, first examined on July 20, 1895. She has complained since June, 1894, of huskiness, hoarseness, a tickling sensation of the throat, and considerable pain on deglutition, and attributes all her symptoms to exposure at that time. She has lost much flesh and is fairly weak. Cough considerable, expectoration muco-puru-

lent; night sweats slight. She has had only one hæmorrhage—in November, 1894. The pain is mainly localized on the right side of the larynx. Difficulty in swallowing has lately increased so greatly that she is able to swallow only small pieces. Her father is still living, seventy-one years of age, in good health; her mother died at sixty-nine, of abscess of the liver. One brother died of consumption at thirty-four years. Previous history good. Bacilli and other germs were found in the sputum.

Examination of the lungs by Dr. Paquin and Dr. Lemen reveals the following: A fairly large cavity in the right sub-clavicular space, surrounded by an area of consolidation; left lung consolidated at its upper extremity.

Examination of the Nose and Throat.—Right nasal cavity normal, mucous membrane soggy and anæmic; rhinopharynx subject to chronic congestion; pharynx presents a few granulations. Both tonsils atrophied; palate of good color. Varices in considerable number on the posterior surface of the tongue. Larynx greatly infiltrated, also the arytenoids, aryteno-epiglottic folds, posterior laryngeal wall, and ventricular bands; small ulcers on the inner surface of both arytenoids. The infiltration of this larynx was extreme—in fact, greater than I have heretofore seen; the epiglottis was fairly normal, accounting, perhaps, for the possibility of any deglutition.

The patient's evening temperature on admission was 103° ; the next day it was 104.8° ; and for some time afterward it ranged about the 104° mark. The morning temperature was normal or just below. The number of respirations was over forty, going down as low as thirty when the temperature was lower.

Serum was used in this case in increasing doses, beginning with 1.6 cubic centimetre; at present four cubic centimetres are used. Submucous injections of Chappell's solution (one drop) were made in the apex of the infiltrated left arytenoid on August 8th, and in a similar position on the right side on August 26th. The solution was injected daily into the larynx, and spraying of a two-per-cent. menthol solution was administered four times a day. Even before this local treatment

had time to become in any way effective—in fact, before it was used—the patient began to improve, the temperature declining and the respirations diminishing in frequency. The throat symptoms improved, and the patient felt far more comfortable. On August 9th the right arytenoid became more swollen, and for ten days the condition of the larynx was somewhat worse, and this was due, I think, to the development of a perichondritis. Since that time she has gradually improved, until at the present time the throat gives her far less trouble. It is interesting to note the gradual diminution of temperature. From an evening temperature of 104° it has descended to 102° , showing almost as marked a decrease as in the fourth week of typhoid fever. While the patient's condition is still serious, I think it will be admitted that the six weeks of serum treatment have resulted favorably and that the promise is fairly good.

CASE VII.—Mr. H. C. B., of Griggsville, Ill., was referred to me by Dr. Cale on July 23d. For eighteen months more or less hoarseness had been present, unaccompanied by pain until within the past three weeks; he was just beginning to have slight difficulty in swallowing. Cough quite severe, expectoration muco-purulent. He had had night sweats, but they had been absent for some time. The only tuberculosis in his family was in the case of his father, who died at fifty, of pulmonary tuberculosis.

Microscopical examination showed abundant tubercle bacilli.

Examination of the Nose and Throat.—Nose normal; mucous membrane pale; palate and epiglottis anemic; tonsils atrophied; moderate infiltration of the ventricular bands and arytenoids; posterior wall also infiltrated. This was evidently an early case of laryngeal tuberculosis, and he was at once put under vigorous treatment with antitubercle serum. For his laryngeal affection, menthol spray, inhalation of compound tincture of benzoin, and occasional applications of lactic acid were used. After three weeks of treatment his condition improved considerably, so much so, in fact, that it was deemed wise to send him home for his family physician

to continue the serum treatment, as the larynx required slight, if any, attention. The infiltration appeared slightly reduced.

CASE VIII.—Miss J. M., aged twenty-eight years, was referred to me by Dr. Fulgham, of Jackson, Miss., with the following history: For five years she had suffered from tuberculosis pulmonalis, which condition had been held fairly in check by judicious climatic therapy. While at times she had been reduced in flesh and strength, she had quite as often regained them. She had had only one hæmorrhage. While her throat had been for years a source of trouble to her, it had been very much worse since January. Since that time there had been great pain in the region of her larynx, which was increased by deglutition, and which showed no tendency to improve. Her voice was not materially affected. There had been no tuberculosis in her family.

The lungs exhibited dullness at the right apex with prolonged, high-pitched expiration, also some dullness on the left side. Tubercle bacilli were present in the sputum.

Both arytenoids were found considerably infiltrated and heightened in color; the infiltration extended downward to the posterior wall of the larynx and forward for some distance along the ventricular bands and the aryteno-epiglottic folds. No ulceration could be distinguished. Both cords appeared normal.

Serum treatment was advised, accompanied with appropriate laryngeal applications. She returned home without submitting to treatment at my hands, her physician with my concurrence deciding to use the serum at home for a time.

CASE IX.—E. A., aged thirty-three years, a conductor, entered my division of the Missouri Pacific Hospital on August 23d. For five months he had complained of dysphagia, hoarseness, and pain in the larynx. This latter symptom was a trifle better than it had been. Cough slight. Expectoration muco-purulent; night sweats occasionally; slight hæmorrhage on August 22, 1895; no dyspnoea except on exertion. Since February he had lost twenty-two pounds in weight. He stated that he had had "bronchial trouble" for six years.

Five years ago he acquired syphilis, and his present trouble had been ascribed to this by at least one laryngologist.

Tubercle bacilli were found in great numbers in his sputum.

Examination revealed a greatly tumefied epiglottis, the swelling being on the anterior surface. This held the epiglottis well over the larynx, so that an examination of the lower portion was possible only after great patience and care. The posterior wall of the larynx and the tissue above the arytenoids were characteristically pale and infiltrated. No ulceration was discoverable. This patient suffers possibly from both tuberculosis and syphilis of the larynx, but the chances are that the greater source of trouble is the tuberculosis. Iodide of potassium in large doses, which he bore fairly well, considering the condition of his throat, effected no change in the larynx or in the laryngeal symptoms.

During the few days required for examination the dysphagia and pain have increased.

Patient has been put under a vigorous course of serum treatment.

The further progress of these patients will be given in a later paper.

In all the cases, as a matter of course, great attention was paid to dietetic and hygienic indications; in the more desperate cases stimulants were administered; in the more favorable ones, viz., Cases I and IV, nothing in the way of tonics or general remedies was used. Pasteurine tablets were given in all the cases, as they exert an admirable influence in keeping the mouth clean and the breath inoffensive. As was to be expected, the serum did not exhibit so happy an effect in the cases of mixed infection as in the earlier cases where the tubercle bacilli alone were implicated.

Without any allegation of conclusive proof, these unselected cases exhibit a more favorable course than any which have come under my observation previous to my use of sero-

therapy in laryngeal tuberculosis. Taken as a whole, they suggest a far better prognosis than is generally accorded to the disease. Case I is almost remarkable. Examined by five laryngologists and given a hopeless prognosis by all, the patient represents the strongest proof of the value of the antitubercle serum. Add to this the fact that no local treatment was used, on account of his absolute refusal to permit it, and the proof becomes enhanced. There can be no doubt about the diagnosis, since the opinion of so many laryngologists who examined him demands absolute and unqualified belief. True, some cases of spontaneous recovery have been reported; still, in this case the following facts are to be considered: His improvement was coincident with the use of the serum; his symptomatic amelioration bore a direct relation to the amount of serum used. When the serum was discontinued for four weeks, his cough increased, his voice became less phonic, his difficulty of swallowing returned, and pain and other symptoms reappeared. All these rapidly disappeared when treatment was resumed. More than this, he improved correspondingly more when the doses of serum were increased from two to four cubic centimetres.

Cases II and III are examples of results in hopeless cases. In both the pulmonary tuberculosis had advanced far into the third stage, with extensive laryngeal involvement and mixed infection, and both patients, after great emaciation, accepted sero-therapy as a last resort, though they were advised of the utter hopelessness and futility of treatment. In spite of this the condition of both was greatly improved, and not only was the laryngeal tuberculosis, which is so typically progressive in its course, stayed, but the change in the characteristic symptoms and appearance denoted great progress toward resolution.

In view of the results which have thus far been ob-

tained, it is fair to assume that more extended observation and experience will open the field more largely; I even expect that the solution of the vexed problem of the relief and cure of laryngeal tuberculosis may have sero-therapy for its basis, and that other therapeutic agents are purely adjuvant, as they attack the morbid processes without affecting fundamental conditions.

A number of therapeutical possibilities may properly be considered:

I. *Early Tracheotomy*.—It is well known that tracheotomy improves, for a short time, almost all cases of laryngeal tuberculosis, presumably on account of the rest which this operation affords the larynx. The improvement which took place in the larynges in all the cases presented in this paper encourages the hope that tracheotomy will still further augment the chance of recovery and hasten the amelioration. Thus far in none of my cases have I felt warranted in attempting such a radical measure early in the course of the disease, but I feel sure that good may in this way often be accomplished.

II. *Curettement, Arytenoidectomy, and Similar Operations*.—These operations, which have been presented so scientifically by Heryng, Krause, Gouguenheim, Lennox Browne, Gleitsmann, Schmidt, and others, have won a place in the treatment of laryngeal tuberculosis which far surpasses that of any other plan heretofore advocated. Combined with sero-therapy, whereby a generally improved constitutional condition is practically warranted, this plan is by all means inviting. However, it may well happen that closer study will demonstrate that some of the conditions now thought irremediable without curettement may show a special tendency to reduction by the use of serum. Again, the serum itself offers a field for improvement which will enhance the results already attained.

III. *Submucous and Intralaryngeal Injections.*—Chappell, by the use of submucous and intralaryngeal injections of his creosote solutions, has accomplished a great advance beyond all question. I have seen many of his patients and I can testify to the value of his method. The one thing which seemed to be lacking was the uncertainty of securing relief from the accompanying pulmonary affection. This lack I consider is probably supplied by sero-therapy. In my own hands, as shown by the reports of cases, Chappell's method has been attended with fair success. In Case II it was not so favorable, however; the disease had obtained so decided a foothold and the infiltration was so excessive that very little was to be expected. Case III demonstrated the soothing effect of the treatment; in Cases V and VI the patients improved under its use.

A still brighter possibility attaches to the use of submucous injections of antitubercle serum into the affected portions of the larynx. If, as it appears, the serum is antidotal to the poison of the tubercle bacilli and prevents the growth of the micro-organism, there is every reason to expect that this influence will be increased by bringing the agent in close proximity with the morbid process. I have done this in a single instance, too recently to afford any marked results, but sufficient, I consider, to demonstrate its probable harmlessness. In this connection it must not be forgotten that mixed infection may show in the larynx the same prominence that it does in the pulmonary affection; its closer study may modify our views and establish the exact rôle which sero-therapy is in this connection to play in laryngeal tuberculosis.

IV. *Topical Applications, Sprays, etc.*—I consider that these agents are necessary in practically all cases. While the local condition is largely dependent for its origin and

development upon the pulmonary affection, it is still a local condition, requiring local treatment quite as much as if it existed upon the skin or at some more accessible point. Lactic acid will always have a place in the treatment of tubercular ulceration of the larynx. Menthol sprays, inhalations of compound tincture of benzoin, iodoform, and remedies of this character will continue of service whatever the ultimate outcome of the serum treatment of laryngeal consumption.

V. *Serum as a Sole Curative Agent.*—The experience in Case I would naturally lead one to infer that the anti-tubercle serum alone in laryngeal tuberculosis might in at least some cases accomplish a cure. If the diphtheria antitoxic serum can destroy the action of the Klebs-Loeffler bacilli in the pharynx, larynx, and nose, and if the tetano-antitoxine can obviate the local action of the tetanus bacilli, why is it not possible to negative the action of the tubercle bacilli in the larynx by using the serum obtained by immunizing the horse against tuberculosis? True, one need not expect so rapid a result in a chronic disease as in an acute affection; still, it is quite as possible and is to be expected. The results can never be so marked in laryngeal tuberculosis as in pulmonary tuberculosis, on account of the poorer blood and lymph supply of the former as compared with the latter.

In conclusion permit me to state that I entered upon the use of the Paquin anti-tubercle serum with two antagonistic thoughts uppermost in my mind. In the first place there arose before me the lesson of the past with its dry bones of disproved and discarded remedies, once vaunted to the skies. On the other hand there arose before me the lesson of the future, with its hopes and prospects, hopes amply based upon the improvements already made by the application of bacteriology to surgery and the

newer principle of the cure of disease by the use of immunizing serum in other diseases.

Confirmation has been offered by Professor Maragliano, of Genoa, in a paper read before the British Medical Association, in which he professes to have had twenty recoveries from pulmonary tuberculosis treated by antituberculous serum. Marson (*Lancet*, p. 330, No. 3754) reports, out of thirty-eight cases of tetanus treated by various physicians with tetano-antitoxine, twenty-five recoveries. Klein, at the recent meeting of the British Medical Association, said of the diphtheria antitoxine: "Although certain adverse criticisms have been brought forward against its use, one thing, I think, can not be gainsaid—namely, that the scientific basis for the application of antitoxic serum is as firmly founded and as thoroughly established as the use and application of any known drug." Washbourn, at the same meeting, said: "The principle is one that appears to be applicable to all bacterial diseases." I myself expressed a similar opinion in a discussion before the St. Louis Medical Society in January, 1895, stating that it was only a question of time when the active principle would be isolated. Quite important too are the observations of Lemen and Wiggins on the use of the antitubercle serum in the treatment of acute tuberculosis, as well as those of Cale in the treatment of surgical tuberculosis. Again, Dr. Paquin's original and subsequent papers exhibit results in pulmonary tuberculosis unattainable by any other plan of treatment. With these opinions and with my own results thus far, need I apologize because my first hopes and fears have been replaced by a sanguine feeling that sero-therapy offers better possibilities than anything heretofore suggested for the relief and cure of laryngeal tuberculosis?

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EDITED BY

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